REMARKS:

In the Claims:

The Examiner has rejected claims 1-3 as being anticipated by Hayashi et al. (US 6,542,342. Hayashi teaches, for example with reference to Fig. 11, a tunnel junction sensor stack disposed between upper and lower electrode layers, wherein the sensor stack includes a free layer that extends beyond an active area of the sensor stack. As shown in Fig. 11, the free layer is adjacent to the lower lead, but a hard bias layer is sandwiched between the free layer and the lower lead. This requires the free layer to bump up over the bias layer. This bumping up can affect free layer performance. Although Hayashi mentions (only in passing) that the bias layer 10 can be constructed of certain materials that happen to be antiferromagnetic, those skilled in the art will recognize that for an AFM material to effectively exchange couple with a ferromagnetic material, the AFM material must be relatively very thick. The configuration taught by Hayashi does not allow for a thick bias layer as can be seen by the fact that the bias layer is squeezed between the free layer and the lower lead.

The structure taught by Hayashi, although it may use an electrically insulating bias layer (10) still requires the use of an insulating fill layer 9 between the free layer and the upper lead. This requires further additional manufacturing complexity by requiring the formation of the insulating fill layer 9 in addition to the bias layer 10. The use of this insulating fill layer also consumes considerable gap budget between the leads 3 and 8B.

Claim 1 of the present invention has been amended to recite that the sensor stack is sandwiched between first and second electrodes, and that the free layer is formed adjacent to the first electrode. The second AFM layer (used to bias the free layer) is disposed between the free layer and the second lead. Support for this amendment to claim 1 can be found with reference to Figs, 2A and 2B.

By arranging the second AFM in this manner, this second AFM layer can

function as both a biasing structure and as an electrically insulating fill layer. This improves the manufacturability of the head by eliminating the need for a separate insulation layer as is required by Hayashi, but also and perhaps more importantly allows the second AFM layer be formed thick to ensure exceptional exchange coupling with the free layer. This arrangement also allows the free layer to be deposited on a flat surface, rather than having to bump up over the bias layer as is shown by Hayashi. The structure claimed in amended claim 1 allows the bias layer to be located within the already existing gap budget already consumed by the sensor stack without the need to further increase the spacing between the leads.

The applicant sincerely believes that claim 1 as amended is novel over the prior art. Claim 2 which depends from allowable claim 1 is also necessarily patentable over the prior art.

Claim 3 has been amended to recite that the insulating second AFM material fills the space between the free layer and the second lead. This further distinguishes claim 3 from the structures taught by Hayashi, by further eliminating the need for a separate insulation layer. Because of this and also because of the fact that claim 3 depends from allowable claim 1, the applicant sincerely believes that claim 3 is allowable over the prior art.

The Applicant sincerely believes that the remaining claims in the present application are now in condition for allowance. Accordingly, a notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 971-2573. For payment of any additional fees due in connection with the filing of this paper, the Commissioner is authorized to charge such fees to Deposit Account No. 50-2587 (Order No. SJO920000096US4).

Respectfully submitted,

By: _____ Date: 5-12-2006

Ron Feece
Reg. No. 46,327

Zilka-Kotab, PC
P.O. Box 721120
San Jose, California 95172-1120
Telephone: (408) 971-2573
Facsimile: (408) 971-4660